1. There is a gene for sleepwalking. A father who is **always sleepwalking** has children with a mother who is **sometimes sleepwalking and other times she doesn't sleepwalk**. After many years they have many children expressing the percentages of the phenotypes shown below.

25% females that **sometimes sleepwalk and other times never do**	25% females that are **always sleepwalking**	25% males that are **never sleepwalking**	25% males that are **always sleepwalking**

a. **Construct** a Punnett square that shows what the genotypes of the parents & children are.
b. **Identify** & **explain** the type(s) of inheritance pattern(s) shown

2. A dihybrid purple bodied, spiny snake x double recessive white body, smooth snake (testcross) produced the offspring in the table below.
a. Calculate the distance between these 2 genes
b. Calculate the Chi square value for the hypothesis that these two genes assort independently.

731 Purple, Spiny	698 White, Smooth	62 Purple, Smooth	53 White, Spiny

3. Two genes are linked and located 31 m.u. apart. If there were 1104 parental type offspring from a dihybrid x double recessive (testcross), what was the total number of offspring from the testcross?

4. 4 Genes, ABCD, control 4 different traits in an organism & are unlinked genes. For the cross below, what is the probability that the offspring will be heterozygous for all 4 traits?

AaBbccDD x AabbCcdd

5. 1 couple consisting of a homozygous dominant individual & a heterozygous individual have children. A second couple, both heterozygous, also has children. Assume that a child from couple 1 and a child from couple 2 eventually have children together. What is the probability of their child being homozygous recessive?

6. A woman (heterozygous for brown eyes & a carrier for hemophilia) and a man (with green eyes & hemophilia) have children. Assuming that hemophilia is X-linked recessive & green eye color is autosomal recessive, what is the probability of them having a green-eyed female child with hemophilia?

7. Hair color in humans is controlled by 2 genes: B for tone of color & M for amount of color. BBMM, BbMM or BBMm is black; bbMM or bbMm is light brown; BBmm or Bbmm is dark brown; bbmm is blonde. Write the possible & impossible phenotypes for each cross.
a. light brown x light brown
b. blonde x black
c. light brown x blonde
d. Dark brown x blonde